

FROM FARM TO FACTORY

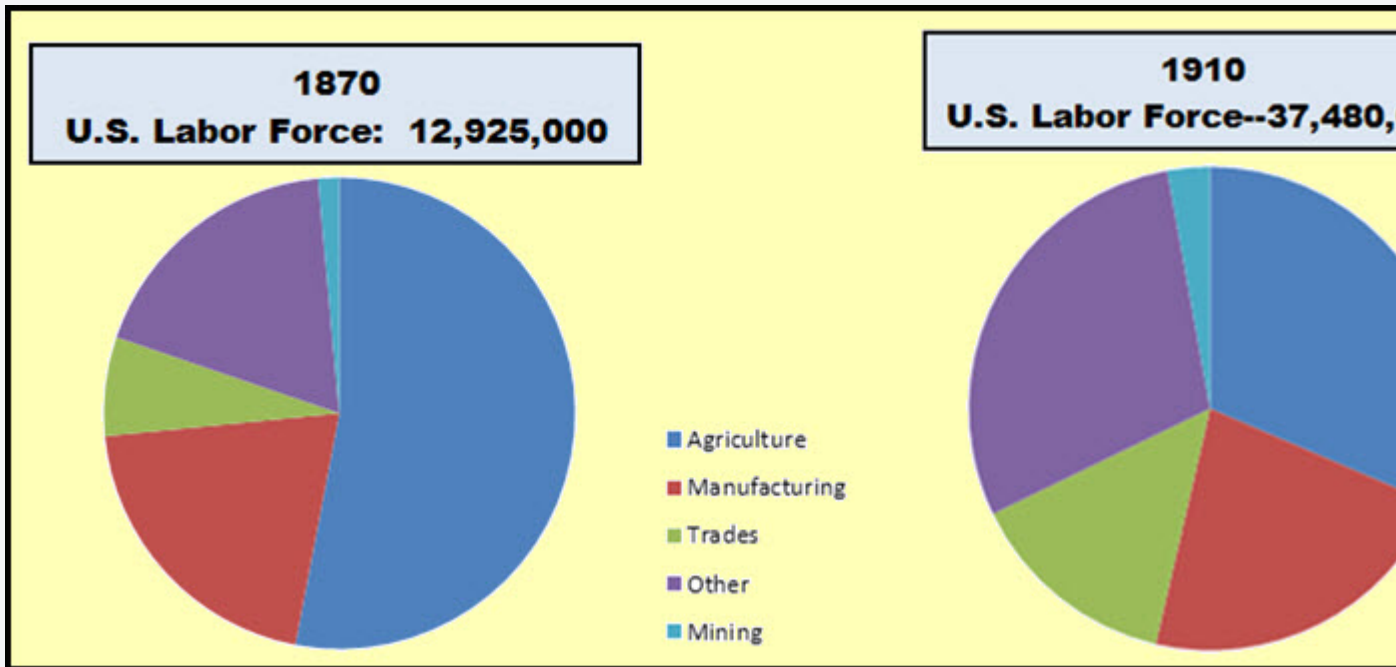


Unit Overview

When the Civil War began in 1861, the United States produced almost \$2 billion worth of goods each year. By 1900, the country was delivering over \$13 billion in manufactured products annually and ranked first among the world's industrialized nations. What factors contributed to this rapid growth in industry? In this unit, you will examine the technological innovation, the development of heavy industry and business ingenuity that made this remarkable transformation possible.

From Farm to Factory

The last decade of the nineteenth century was one of dynamic change. America's workforce shifted from agriculture to industry as mechanized farming, the rise of large corporations and new technology sent workers from the fields to the factories. Farming operations required less manual labor following the development of the American gasoline-powered **tractor** by Charles Hart and Charles Parr. These men opened their business in Wisconsin and moved Iowa in 1905. Unpopular at first, their tractors were soon replaced by heavier, four-wheeled models that began to catch on by 1910. Henry Ford introduced the more affordable Fordson in 1917 and captured 77% of the market. Tractors could pull plows, haul livestock, carry hay and drag other new pieces of farm machinery, including reapers, balers and combine harvesters. Farm animals traditionally performed these tasks, but the average farmer spent 20% of his profit on their food and care. Farming quickly became more efficient and more productive. It also freed agricultural workers to become part of America's growing industrial complex.



Machine Power: Increasing Productivity ((01:27)

Go to Questions 1 through 4.

The Growth of Industry

By 1878, the United States had re-entered a period of prosperity after the long depression of the mid-1870s. In the next twenty years, industrial production, workers employed in industry and plants devoted to manufacturing all more than doubled. The annual value of all manufactured goods increased from about \$5,400,000,000 in 1879 to \$13,000,000,000

in 1899. The expansion of the iron and steel industry, always a key factor in any industrial economy, was even more impressive. From 1880 to 1900, the annual production of steel in the United States went from about 1,400,000 to more than 11,000,000 tons. Before the end of the century, American companies surpassed British counterparts in the production of iron and steel; they also provided more than one-quarter of the world's supply of pig iron.

Many factors combined to produce this burst of industrial activity. America's vast amount of natural resources was indispensable to its economic progress. The United States held one-half of the world's coal supply along with iron and oil reserves. Westward expansion contributed quantities of gold, silver, copper, lead and lumber. Developing the natural resources found in the American West offered new sources of money for investment and stimulated the demand for improved transportation. The construction of new railroads, especially in the West and South, increased the demand for steel rails and had a major impact on the expansion of the steel industry. The railroad mileage in the United States surged from less than 93,262 miles in 1880 to about 190,000 miles in 1900.

Andrew Carnegie and Carnegie Steel

The life of Andrew Carnegie represents the great American success story. In 1848, he and his poverty-stricken family arrived in America from Scotland. Carnegie became a telegraph operator for the Pennsylvania Railroad and moved up the corporate ladder. Using money that he made through a series of investments, he opened his own ironworks company. In 1872, the enterprising executive built a massive steel mill near Pittsburgh. Using a Bessemer converter, Carnegie's engineers were able to construct larger blast furnaces and faster rolling mills. Iron ore entered at one end of the continuous operation and emerged as steel rails on the other end. Andrew Carnegie sold Carnegie Steel in 1901 to J. P. Morgan for \$480 million dollars, which would equal over \$13 billion in today's market.



Advancements in technology made factory production more efficient and encouraged the construction of larger plants. For example, the utilization of the Bessemer and open-hearth processes in the manufacture of steel resulted in improved products and lower production costs. A series of major inventions, including the telephone, typewriter, linotype, phonograph, electric light, cash register, air brake, refrigerator car, and the automobile, became the bases for new industries. Many of them also revolutionized the whole manner of conducting business. The use of petroleum products to provide heat and light became the cornerstone of new industries that led to the establishment of powerful public utilities.

Although an abundance of natural resources and new inventions played a major role in the growth of American manufacturing, none of it would have been possible without a major infusion of cold, hard cash. Money was necessary to purchase raw materials, to hire workers and to buy equipment. The **corporation**, a business organization formed by individuals that pooled their money and became company **stockholders**, offered new opportunities for the large-scale financing of business enterprises. It attracted new capital and encouraged European investments in the American market. All this industrial activity required executives with astute leadership, organization skills and financial knowledge. The entrepreneurs of the late nineteenth century received both praise and condemnation for their roles in big business. John Rockefeller of Standard Oil and Andrew Carnegie of Carnegie Steel were two of the best known figures of their time. Railroad builders and promoters also became legendary for both positive and negative reasons. Sometimes known as the robber barons, this group included Cornelius Vanderbilt, Leland Stanford, Collis P. Huntington, Henry Villard and James J. Hill.

Go to Questions 6 through 10.

From East to West and North to South

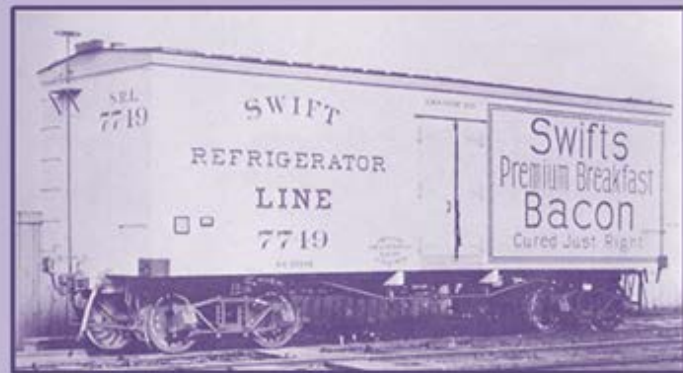
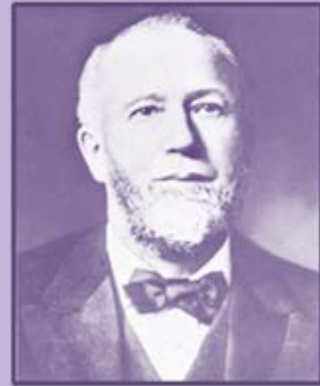
The late nineteenth century also experienced a wide geographic distribution of industry. The northeast sector from Massachusetts to Pennsylvania continued to be the most heavily industrialized section of the United States, but there was a substantial development of manufacturing in the states bordering the to the Great Lakes and in certain sections of the South. The experience of the steel industry reflected this new pattern of diffusion. Two-thirds of the iron and steel production was concentrated in the area of western Pennsylvania and eastern Ohio. After 1880, however, the development of iron mines in northern Minnesota (the Vermilion Range in 1884 and the Mesabi Range in 1892) triggered the construction of plants in the Chicago area. Iron deposits in Tennessee and in northern Alabama also encouraged iron and steel industrialists to locate in these states.

Most manufacturing in the Midwest was in enterprises closely associated with agriculture and represented a growth in companies that had first been established before 1860. After 1875, meatpacking became a major business and almost a Midwestern monopoly since the country's largest stockyard was located in Chicago. Gustavus Swift, founder of Swift

and Co., organized his meat business according to the principle of **vertical integration**. His firm handled the entire operation from farm to table. Milling flour, brewing, manufacturing farm machinery and producing lumber were other important Midwestern industries.

The Swift Refrigerator Line

With the opening of Union Stockyards in 1865, Chicago became the site of the country's largest cattle auction. Businessmen like Gustavus Swift bought and shipped livestock to various destinations on the eastern seaboard for slaughter. He noticed that the animals always seemed to lose weight on the trip. Swift built a large meat-packing facility near the stockyards and employed engineers to design refrigerated train cars. This enabled him to ship dressed beef and pork rather than the livestock. Swift also had his own delivery wagons that distributed his product on arrival. Swift and Company was organized as a vertically integrated firm that was capable of handling all its functions within the company. This enabled Swift to cut costs and to maintain competitive prices.



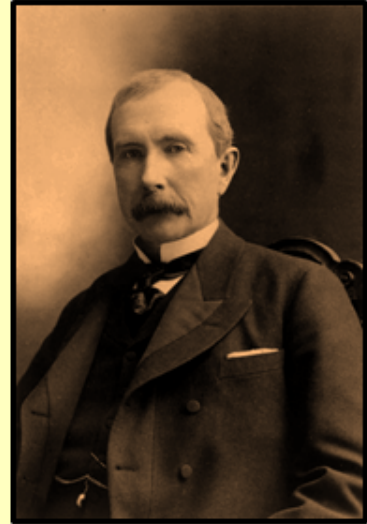
Textiles spearheaded the move toward industrialization in the southern states. Cotton mills became the symbol of the New South; mills and mill towns sprang up in the Piedmont region from Virginia to Georgia and into Alabama. By 1900, almost one-quarter of all the cotton spindles in the United States were in the South, and southern mills were expanding their operations more rapidly than were their well-established competitors in New England. The development of lumbering in the South was even more impressive, though less publicized. By the end of the century, the South led the nation in lumber production and contributed almost one-third of the country's annual supply.

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Industrial Combinations

The spread of modern manufacturing across the country was part of a movement that was converting the United States into an industrial nation. It attracted less attention, however, than the consolidation of competing firms into large organizations that dominated entire industries. This trend captured the attention of the American public in 1882 when John D. Rockefeller and his associates organized the Standard Oil Trust under the laws of Ohio. A **trust** was a new type of industrial organization. In this business model, a small group of men, known as trustees, combined several companies involved in the same industry, influenced decisions by holding vast amounts of stock and earned large profits for their stockholders by removing the competition. The practice was also known as **horizontal integration**.

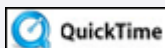
Standard Oil pressured its rivals through a tactic known as **predatory pricing**. Rockefeller lowered prices, forced similar companies out of business and raised prices again later. When his competitors failed, he invited them to join Standard Oil. Most accepted the offer because they had no other option. This enabled Standard Oil to capture 95% of the nation's oil refining capacity. Other corporations quickly followed Rockefeller's example, and the trust became a popular method for the creation of **monopolies**. A lack of competitive pricing permitted the trusts to raise prices whenever they saw fit and to control the market for their product.



John D Rockefeller and Standard Oil

During the Civil War, John D. Rockefeller prospered as a grain dealer in Cleveland, Ohio but believed that he could make more money through a new business venture. Due to its close proximity to the Pennsylvania oil fields and its railroad connections, Cleveland had become a major refining center for the production of kerosene. Rockefeller established Standard Oil of Ohio and became the country's leading refiner. Like Swift, he operated on the principle of vertical integration and controlled production along with sales from the oil well to the kerosene lamp. Rockefeller invested his profits in the development of Mexican oil fields and successfully competed against Russian and Middle Eastern oil producers. After moving its headquarters to New York in 1895, Rockefeller's firm continued to dominate the petroleum industry at home and abroad.

In 1892, the courts of Ohio ruled that the Rockefeller's trust violated that state's antimonopoly laws. Standard Oil then reorganized as a holding company under more lenient laws in New Jersey. Thereafter, holding companies or outright mergers became the favorite forms for the creation of monopolies, but the term trust remained in the popular vocabulary as a common description of any monopoly. The best-known mergers of the period were those leading to the formation of the American Tobacco Company (1890) and the American Sugar Refining Company (1891). The latter was especially successful in stifling competition after it quickly gained control of most of the sugar refined in the United States. By 1900, one-third of America's productive capacity was controlled by its one-hundred largest businesses. The vast power and influence of these corporations concerned both reformers and politicians in the decades to come.



Big Business: Rockefeller and Carnegie (01:54)

American Products and Foreign Trade

American products in the world market kept pace with the growth of the domestic industry. The annual value of exports, excluding gold and silver, from the United States in 1877 was about \$590,000,000; by 1900, it had increased to well over \$1 billion. Imports also rose during this same period but at a much slower rate, which gave the United States a healthy trade balance. Agriculture furnished the bulk of U.S. products that were shipped overseas. Cotton, wheat, flour and meat products were consistently the items with the greatest trade value while petroleum products led the nonagricultural sector.



Coca-Cola ad from 1900

After the turn of the century, **mass production** and distribution added to the wide variety of products that Americans sold at home and overseas. Henry Ford's first assembly line, designed in 1913, offered dramatic results. It took twelve hours to build a Ford Model-T in 1910; by 1914, constructing the same car took one and one-half hours. This format also allowed Ford to cut the cost of his automobiles. In 1909, a Ford car was priced at \$950; the sticker price of a similar model in 1923 was \$295. Public awareness of new American products in the United States and abroad was encouraged through advertising. Trademarks, slogans, brand names, guarantees, celebrity endorsements and other gimmicks enticed consumers everywhere. U.S. companies increased their advertising budgets from \$682 million in 1914 to \$3 billion in 1929.

Go to Questions 15 through 20.

What's Next?

While American industrialists focused on production and profits, many workers encountered low wages, long hours and dangerous conditions. Unable to fight single-handedly against influential, powerful corporations, they organized in the form of unions and made demands for change through strikes, pickets and boycotts. However, these tactics did not easily win public or political support. The next unit examines how labor unions evolved into strong organizations that could bargain on equal terms with employers. Before moving on, review this unit and complete questions 21 through 30.

Go to Questions 21 through 30.